A7011A & A7012A PCI-X 2-Port Gigabit Ethernet Card Installation Guide

HP-UX & OpenVMS Networking

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Localized Documentation

This Installation Guide has been translated to:

日本語 http://www.docs.hp.com/ja/index.html

Contents

1. HP-UX Installation

Hardware and Software Installation Procedure 5
Step 1: Access the system card bay 5
Step 2: Install the card 6
Step 3: Connect the card to the network 6
Step 4: Prepare to install the software 6
Step 5: Install the latest software 7
Step 6: Configure the card using SAM 7
Step 7: Verify the installation 7
Optional Step: Configure Jumbo Frames Size 8
Network Card Configuration Worksheet 9

2. OpenVMS Installation

Preparing for Installation 13
Installing the Adapter 14
Installing the Card 14
Boot the System 14
Configure the Card Using LANCP 14
Optional Step: Defining Jumbo Frame Size 15

A. Regulatory Information

Card Physical and Environmental Specifications 17
FCC Statement (For U.S.A.) 17
Canada 18
EMI (Australia and New Zealand) 18
VCCI (Japan) (PCI Card Only) 18
EMI Statement (European Community) 19
Laser Safety Statements 19
A7011A & A7012A Declaration of Conformance 20

Contents

1 HP-UX Installation

This chapter contains the following sections that describe how to install the A7011A or A7012A PCI-X 2-Port Gigabit Ethernet adapters on an HP-UX system:

- “Hardware and Software Installation Procedure”
- “Network Card Configuration Worksheet”

Thank you for purchasing HP I/O Cards

If you are installing an HP I/O card as an add-in device, please review this document before installation.

If an HP I/O card was factory installed in your server, you can skip to “Step 7: Verify the installation” on page 7 to verify the installation.

HP welcomes your input. Please email us at: netinfo_feedback@cup.hp.com with comments or suggestions on HP I/O Cards or related documentation.

All product documentation, including a comprehensive support guide, installation guide, release notes, as well as information on supported servers, HP-UX versions, drivers, and patches, is available online at: http://docs.hp.com

1. Click on “browse by topic”.
2. Click on “networking and communications”.
3. Click on the *1000Base-T and 1000Base-SX (Gigabit Ethernet)* product category.

Hardware and Software Installation Procedure

These instructions apply to the A7011A (1000Base-SX--fiber-based) and A7012A (1000Base-T--copper-based) PCI-X gigabit Ethernet cards on HP-UX 11i v 1.0. The Base-T cards operate at 10 or 100 Mbit/s in either full- or half-duplex modes and at 1000 Mbit/s only in full-duplex mode. The 1000Base-SX cards operate only at 1000 Mbit/s and in full-duplex mode. Ensure that you set both your switch and gigabit Ethernet card to autonegotiation or set both to the same speed and duplex mode. The LAN card driver for HP-UX 11i v 1.0 is on the December 2003 application CD; for HP-UX 11i v 2.0, the driver is on the March 2004 application CD. Note: you will not need to perform the following hardware and software installation steps if your Gigabit Ethernet card was factory installed (product option 0D1) or its LAN port is “built-in” or “core” LAN.

These PCI-X gigabit Ethernet cards can be added to your system or replaced without the need to shut down or reboot the system--a process called online addition and replacement (OL*). For instructions on how to perform online addition and replacement (OL*), see *Configuring HP-UX For Peripherals for HP9000 Computers*. The following instructions assume you are not performing online addition and replacement.

Step 1: Access the system card bay

- If the system is running, (and you are not using online addition and replacement), shut it down by executing: `shutdown -h`. Respond “**`y`**” to the continue to shutdown prompt.
- Wait for the system to shut down completely, and then power off the system by pressing the system off button. Ensure that the system is grounded.
- Open the system to gain access to the PCI backplane.

- Select an empty PCI or PCI-X slot and remove the slot cover. The card can operate in PCI as well as PCI-X mode.

Step 2: Install the card

- Check the latest support matrix to see the systems that support this card, how many cards per system, and if any software updates are needed, The support matrix is available on the web at http://docs.hp.com under “Networking and Communications.”
- Observe the antistatic precautions. HP recommends wearing ESD straps when installing the card.
- Record the serial number and MAC address located on the card for future reference.
- Grasp the card by its edges or faceplate with both hands, insert the card into the slot, and firmly but gently press the card in until it is fully seated.
- Secure the card and reassemble the system.

Step 3: Connect the card to the network

- Attach the network cable (or cables) to the card. Attach the connector from a LAN cable to the card (Figure 1). For 1000Base-SX, cabling can be either 62.5 micron or 50 micron multimode fiber optic (MMF) cable with LC connectors. If the remote connection is type SC, you will need an LC-to-SC conversion cable. For 1000Base-T, cabling must be Cat 5 UTP or better with RJ-45 connectors. Refer to the tables at the end of this procedure for operating distances.
- Attach the free end of the LAN cable (or cables) to any unused port(s) on the switch. Set the interfacing ports on the switch to the same settings as this LAN card: either set the card and switch port to autonegotiation, or set them to the same speed and duplex mode.

  The A7012A card does not interoperate with older switches containing a BCM 5400 PHY with a version earlier than C-5. The problem occurs when interfacing with switches such as the HP Procurve Module J4115A; version J4115B fixes the Procurve problem.

  If you are using Jumbo Ethernet frames, ensure that all end stations on a given LAN* have the same maximum transmission unit (MTU) setting. However, switch ports in your LAN can have any MTU setting greater than or equal to the end station’s MTU. (*Note: here “LAN” means that the end stations do not have any routers or layer 3 switches in between them.)
- Ensure power cable is connected to system. Power up the system.

Step 4: Prepare to install the software

- Log in as `root`.
- Check that the `/usr/bin`, `/usr/sbin` and `/sbin` directories are in your PATH using the command: `echo $PATH`
- Check the HP-UX version by entering: `uname -r`

  ```
  # uname -r
  B.11.11
  ```

  The version must be either B.11.11 (11i v 1.0) or B.11.23 (11i v 2.0).
- Install the appropriate patches for your system as described in the Release Notes, which are available on the Web at http://docs.hp.com under Networking and Communications.

Step 5: Install the latest software

- Load the software media into the appropriate drive. The Gigabit Ethernet software bundle (**IEther-00**) for HP-UX 11i v 1.0 is on the December 2003 application CD; for HP-UX 11i v 2.0, the driver is on the March 2004 application CD.
- Run the `swinstall` program to install the software using the command: **`swinstall`**.
- Change the host name after "Source Host Name," if necessary.
- Click the Source Depot Path to identify the registered depot for the appropriate source depot path and activate the OK button to return to the Software Selection Window.
- Highlight the 1000Base-SX/T software **IEther-00** (for cards such as A7011A and A7012A) on HP-UX 11i v 1.0 or 11i v 2.0.
- Choose Mark for Install from the "Actions" menu to choose the product to be installed.
- Choose Install from the "Actions" menu to begin product installation and open the Install Analysis Window.
- Activate the OK button in the Install Analysis Window when the Status field displays a `Ready` message.
- Activate the YES button at the Confirmation Window to confirm that you want to install the software. `swinstall` loads the fileset, runs the control scripts for the filesets, and builds the kernel. This should take about 3 to 5 minutes. When the status field indicates `Ready`, click Done. A Note Window then opens. Click the OK button to reboot the system.

Step 6: Configure the card using SAM

- Log in as `root` and verify that the card and its hardware path are displayed by entering: **`ioscan`**.
- Run the System Administration Manager by entering **`sam`**.
- Double-click Networking and Communications.
- Double-click Network Interface Cards.
- Highlight the Gigabit Ethernet card and choose Configure from the Actions menu.
- Fill in the form according to the instructions using the "Network Card Configuration Worksheet" on page 9.
- Click the OK button to activate the card and then select exit from the File menu until you exit SAM.

Step 7: Verify the installation

- Verify that the connector's Link LED is steadily on (this means the card and driver are installed successfully).
- Obtain the PPA number and the station address of each card by using the `lanscan` command.
- To verify link-level connectivity with a remote system, enter:

  $ **`linkloop -i`** ***`PPA_number remote_station_address`***
- To verify IP-level connectivity with a remote system, enter:

  $**`ping`** ***`Remote_IP_Address`*** and **`netstat -in`**

- Installation is complete when you have successfully run `linkloop`, `ping` and `netstat`. To configure remote systems, see the *Ethernet Support Guide* available on the web at http://docs.hp.com. Do this step only if remote systems have not been previously configured.
- Optionally, if you want to verify that the iether driver appears for each installed card, enter: **`ioscan -f`**

  The `ioscan` output might look like the following:

  ```
  Class I H/W Path Driver S/W State H/W Type Description
  lan 3 1/10/0/1 iether CLAIMED INTERFACE HPA7011A PCI/PCI-X 1000Base-SX 2Port
  GigEAdapter
  ```

  The third column shows the hardware path of the slot in which the card is installed. This path will be different for each installed card.

Optional Step: Configure Jumbo Frames Size

NOTE Jumbo frames are supported only at 1000 Mbit/s.

- Jumbo frames for the `iether` driver on HP-UX 11i v 1.0 have mtu_size in the range of 1501-9000 bytes.

  If you are using Jumbo Ethernet frames, ensure that all end stations on a given LAN* have the same maximum transmission unit (MTU) setting. However, switch ports in your LAN can have any MTU setting greater than or equal to the end station's MTU. (*Note: here "LAN" means that the end stations do not have any routers or layer 3 switches in between them.)
- Obtain the PPA number of the card by entering `lanscan`.
- Choose one of two configuration methods that will permanently save your configuration.

  — use the GUI-based system admin manager (SAM).

  To use SAM, type **`sam`** at the HP-UX system prompt; then double-click Networking and Communications, and then Advanced Configuration--see *Ethernet Support Guide* for details, and then do the steps for verifying the MTU size; or

  edit the following configuration file using an editor such as "vi":

  /etc/rc.config.d/hpietherconf.

  Set the mtusize by editing HP_IETHER_MTU[0]=*mtusize*, and insert the proper interface name: HP_IETHER_INTERFACE_NAME. When the system reboots, the interface will be configured for jumbo frame operation.
- Verify MTU change by entering **`netstat -rn`**. If MTU has not changed, enter the following commands:

  $**`ifconfig lan PPA_number unplumb`**

  $**`ifconfig lan PPA_number ip_address netmask netmask up`**
- To check (or verify) the current Ethernet frame size, enter:

  $**`lanadmin -m PPA_number`**

An alternative way to temporarily** configure jumbo frame size is to enter:

`lanadmin -M mtu_size PPA_number`.

The ***`PPA_number`*** is the one we obtained from the output of lanscan. For the `iether` Gigabit Ethernet driver, the MTU value must be a value between 1501 and 9000 (for Jumbo Frames).

**Note: using `lanadmin` will not preserve your settings across reboots.

Network Card Configuration Worksheet

Fill out one worksheet for each network card you are installing.

Table 1-1 Ethernet Card Configuration Worksheet

Data Type	Required/ Optional	Default	How to Configure (see Note 1)	Example	Your System
Internet Address	Required	0.0.0.0	SAM or `ifconfig` or edit `/etc/rc.config.d/netconf`	196.6.20.2	
Subnet mask	Required if using subnetting	Subnet mask not used	SAM or `ifconfig` or edit `/etc/rc.config.d/netconf`	255.255.248.0	
Station address	Built-in but can be optionally changed	As shown on card	SAM or edit `/etc/rc.config.d/hpietherconf` or temporarily: `lanadmin -A`	0x0060b0c4012f	
Host name alias for this network interface (card)	Required if the system is connected to more than 1 network	None	SAM or edit /etc/hosts	host1	
Link configuration	Required	Autonegotiating	SAM or temporarily: `lanadmin -X`	`lanadmin -X auto_on ppa#` (if already turned off)	
Link speed/ duplex mode	Required	Autonegotiating	Hub or switch (see Note 2) SAM or temporarily: `lanadmin -X`	`lanadmin -X 100fd ppa#`	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1500 bytes	SAM or `edit /etc/rc.config.d/hpietherconf or temporarily: lanadmin -M`	`lanadmin -M 9000 ppa#` (see Note 3 below)	
Receive flow control	Optional	On	SAM or edit `/etc/rc.config.d/hpietherconf` or temporarily: `lanadmin -X`	`lanadmin -X fctrl off`	

Note 1: To configure values permanently, edit the configuration files. Using lanadmin will not preserve your settings across reboots.

Note 2: The speed configuration of the card can be 10, 100, or 1000Mbps and is determined by the speed setting of the hub or switch port to which the card is connected. The card automatically senses this speed. The Base-T card only runs at one speed at a time. To verify the speed selection, run `lanadmin -x ppa#`.

Note 3: The valid MTU range for the iether driver on HP-UX 11i v 1.0 is 257 - 9000; for Jumbo Frames, the valid MTU size is any number from 1501 - 9000.

Operating Distance for 1000Base-T (Copper UTP): Up to 100 meters — Cat 5 and Cat 5E

Operating distances for 1000Base-SX using multi-mode fiber optic cable are as follows:

Description (850nm short wavelength laser)	Modal Bandwidth	Operating Distance
62.5 micron MMF	160 (MHz * km)	2 to 220 meters (6.6 to 722 ft)
	200 (MHz * km)	2 to 275 meters (6.6 to 902 ft)
50 micron MMF	400 (MHz * km)	2 to 500 meters (6.6 to 1640 ft)
	500 (MHz * km)	2 to 550 meters (6.6 to 1804 ft)

Figure 1-1 A7011A PCI-X Fiber-based 2-Port Gigabit Ethernet Card

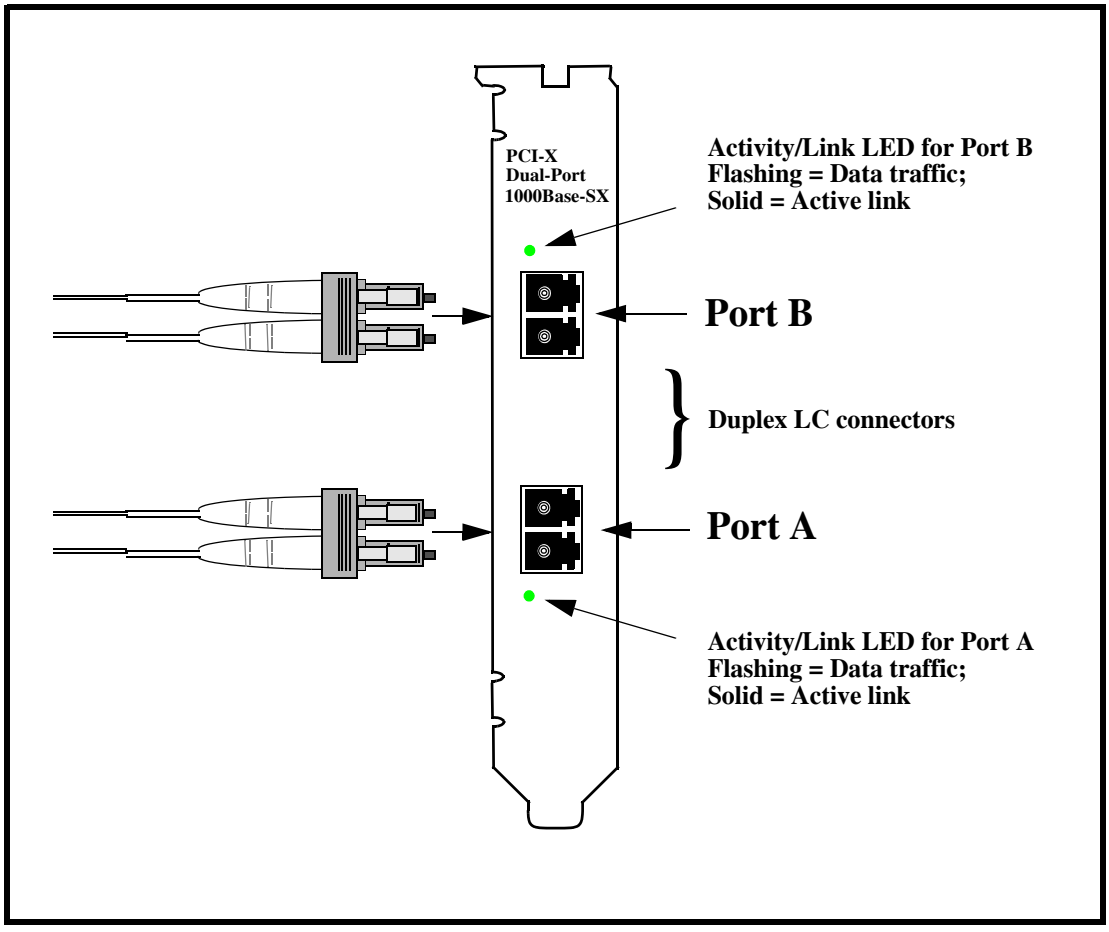
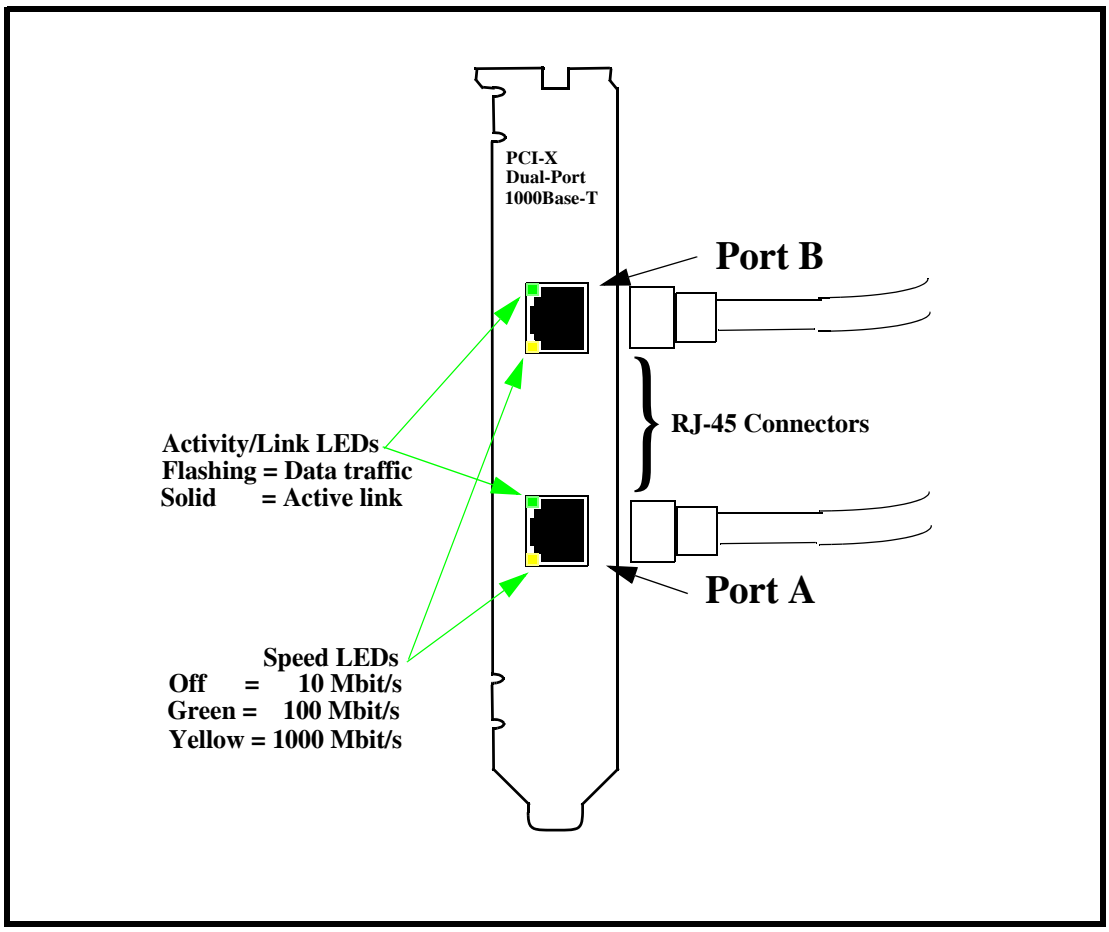


Figure 1-2 A7012A PCI-X Copper-based 2-Port Gigabit Ethernet Card



2 OpenVMS Installation

This chapter contains the following sections that describe how to install the A7011A or A7012A adapters on an OpenVMS system:

- “Preparing for Installation”
- “Installing the Adapter”

Thank you for purchasing HP I/O Cards

If you are installing an HP I/O card as an add-in device, please review this document before attempting installation.

HP welcomes your input. Please email us at: netinfo_feedback@cup.hp.com with comments or suggestions on HP I/O Cards or related documentation.

All product documentation, including a comprehensive support guide, installation guide, release notes, as well as information on supported servers, OpenVMS versions, drivers, and patches, is available online at: http://docs.hp.com

1. Click on “browse by topic”.
2. Click on “networking and communications”.
3. Click on the *1000Base-T and 1000Base-SX (Gigabit Ethernet)* product category.

NOTE Installing the adapter requires proficiency in both hardware configuration and software administration.

NOTE These instructions apply to the A7011A (1000Base-SX--fiber-based) and A7012A (1000Base-T--copper-based) PCI-X gigabit Ethernet cards on OpenVMS V8.2 and higher. The Base-T cards operate at 10 or 100 Mbit/s in either full- or half-duplex modes and at 1000 Mbit/s only in full-duplex mode. The 1000Base-SX cards operate only at 1000 Mbit/s and in full-duplex mode. Ensure that you set both your switch and gigabit Ethernet card to autonegotiation or set both to the same speed and duplex mode. The LAN card driver is included in the OpenVMS V8.2 (or later) installation.

Preparing for Installation

Installation of an adapter requires disassembly of a few system components. Before beginning the installation, see the OpenVMS system documentation for detailed instructions on installing host bus adapters in the PCI slots.

NOTE The maximum number of Gigabit NICs you can install in any OpenVMS system is equal to the maximum number of corresponding card slots in the system. For example, if a system has four PCI card slots, you can install four Gigabit NICs in that system, assuming that all the PCI card slots are empty.

Check the latest support matrix for systems that support these adapters. The support matrix is available at http://docs.hp.com under “Networking and Communications.”

Installing the Adapter

This section contains information on installing the A7011A or A7012A adapter in an OpenVMS system.

WARNING **The installation procedures in this section require opening the computer cabinet, which might expose you to high-energy (high-amperage) circuits and sharp edges in the equipment chassis. Ensure to remove all rings, watches, and other jewelry before opening the cabinet.**

Installing the Card

To physically insert the card into your system, perform these steps:

1. Shut down the system.
2. Insert the card into an empty PCI slot.
3. Connect the card to the network.
4. Power up the system. When the system is up, any error messages will appear on the terminal display or system console.

See the hardware documentation for the card for details.

NOTE The A7012A card does not interoperate with older switches containing a BCM 5400 PHY with a version earlier than C-5. The problem occurs when interfacing with switches such as the HP Procurve Module J4115A; version J4115B fixes the Procurve problem.

Boot the System

1. Log in as SYSTEM.
2. Check the OpenVMS version by executing SHOW SYSTEM. The version must be V8.2 (or later).

NOTE The LAN driver for this card is included in the OpenVMS installation.

Configure the Card Using LANCP

1. Log in as SYSTEM and verify that the card and its hardware path are displayed by executing

   MC LANCP SHOW CONFIG

The LAN device characteristics that can be set include speed, duplex mode, flow control, and whether jumbo frames are enabled. The MC LANCP SET DEVICE and LANCP DEFINE DEVICE commands modify these settings.

2. Set the desired characteristics according to the Network Configuration worksheet (see Table 2-1). For example, use this command:

   MC LANCP DEFINE DEVICE devname /SPEED=1000 /FULL /AUTONEGOTIATE

Table 2-1 Network Card Configuration Worksheet

Data Type	Required / Optional	Default	Where to Configure	Example	Your System
Station address	Built-in and cannot be changed	As shown on card	not configurable	0x0060b0c4012f	
Link configuration	Optional	Autonegotiating	LANCP	MC LANCP SET DEVICE /AUTONEGOTIATE	
Link speed/duplex mode	Optional	Autonegotiating	Hub or switch[a] or LANCP	MC LANCP SET DEVICE/ SPEED=1000 /FULL	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1518 Bytes	LANCP	MC LANCP SET DEVICE/JUMBO	
Receive flow control	Optional	On	LANCP	MC LANCP SET DEVICE/FLOW	

a. The speed configuration of the 1000Base-T can be 10, 100, or 1000 Mbps and is determined by the speed setting of the hub or switch port to which the card is connected. The card automatically senses this speed if autonegotiation is enabled. The card only runs at one speed at a time.

To make any configuration values permanent, enter the values in the LANCP permanent device database.

Optional Step: Defining Jumbo Frame Size

(Jumbo Frames Size (Jumbo frames are supported only at 1000 Mbit/s)

Jumbo frames for the LAN driver on OpenVMS V8.2 have an mtu_size in the range of 1518-8192 bytes.

Jumbo frames are enabled system-wide by setting bit 6 in the system parameter LAN_FLAGS. To enable jumbo frames on individual devices, use the LANCP command SET DEVICE/JUMBO. To disable jumbo frames, use the LANCP command SET DEVICE/NOJUMBO.

To preserve the setting of jumbo frames across boots, when using LANCP, define the setting in the LANCP permanent device database, using the command DEFINE DEVICE/JUMBO.

A Regulatory Information

This appendix contains regulatory statements for the United States, Canada, Australia/New Zealand, Japan, and the European community.

Card Physical and Environmental Specifications

Following are the product physical and environmental specifications of the PCI-X 2-Port Gigabit Ethernet Card.

Physical

Dimensions:	4.75 in by 6.6 in

Electrical

Power consumption:	1A at +5VDC

Environmental

Temperature, Degrees F = (1.8 x Degrees C) + 32

Operating Temperature:	0° C to 55° C
Storage Temperature:	-40° C to 70° C

Humidity

Operating Relative humidity range	15 to 80% @ 40° C

FCC Statement (For U.S.A.)

Federal Communications Commission Radio Frequency Interference Statement

WARNING **This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:**
(1) This device may not cause harmful interference and
(2) this device must accept any interference received, including interference that might cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and cables, such as those received with your system. Changes or modifications to this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Canada

Warning: This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

EMI (Australia and New Zealand)

This product meets the applicable requirements of the Australia and New Zealand EMC Framework.

VCCI (Japan) (PCI Card Only)

This equipment complies with the Class A category for information technology equipment based on the rules of Voluntary Control Council for Interference by Information Technology Equipment. When used in a residential area, radio interference may be caused. In this case, the user may be required to take appropriate corrective actions.

Figure A-1 VCCI Regulatory Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

EMI Statement (European Community)

NOTE This is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

Laser Safety Statements

Laser Safety Statements - U.S. FDA/CDRH - Optical (laser) Transceiver

CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a "Class-I Laser Product" under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968. The Class I label and compliance statement are located on the optical transceiver.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

Laser Safety - European Union - Optical Transceiver Only

CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a "Class 1 Laser Product" per EN 60825-1, Safety of Laser products. Class 1 laser products are considered safe and do not pose a biological hazard if used within the data sheet limits and instructions.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

There are no user serviceable parts nor any maintenance required for the optical transceiver. All adjustments are made at the factory before shipment to customers. Tampering with or any attempt to modify the optical transceiver will result in voided product warranty. It may also result in improper operation of the network card circuitry and possible overstress of the laser source. Device degradation or product failure may result.

A7011A & A7012A Declaration of Conformance

DECLARATION OF CONFORMITY
According to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name:	Hewlett-Packard Company Systems Interconnect Solutions Lab
Manufacturer's Address:	8000 Foothills Blvd. Roseville, CA 95747 USA

declares, that the product

Product Name:	Dual Port PCI-X 1000SX Gigabit Adapter Dual Port PCI-X 1000Base-T Gigabit Adapter
Model Number(s):	A7011A, A7012A
Product Options:	All

conforms to the following Product Specifications:

Safety:	IEC 950:1991 + A1, A2, A3, A4 / EN 60950:1992 + A1, A2, A3, A4, A11 GB 4943-1995. IEC 825-1:1993/ EN60825-1:1994+A1, Class 1 Laser
EMC:	CISPR 22:1997 / EN 55022:1998 - Class A CNS 13438, GB 9254-1988, CFR47, Part 15 Class A CISPR 24:1997 / EN 55024:1998 IEC 61000-4-2 IEC 61000-4-3 / ENV 50204 IEC 61000-4-4 IEC 61000-4-6

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC and carries the CE marking accordingly.

1) The Product was tested in a typical configuration with Hewlett-Packard information technology equipment.

Tom Le, Hardware Engineer

Cupertino, CA, Feb, 2004

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)